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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/579,499	05/16/2006	Kikuo Makita	8028-1059	1614

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YOUNG & THOMPSON 745 SOUTH 23RD STREET 2ND FLOOR ARLINGTON, VA 22202		

EXAMINER	
LEE, PATRICK J	

ART UNIT	PAPER NUMBER
2878	

MAIL DATE	DELIVERY MODE
10/16/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/579,499

Applicant(s)

MAKITA ET AL.

Examiner

Patrick J. Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 May 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 17-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 May 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>05162006</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "43" has been used to designate both multi-layered section and light absorption layer on page 9. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the examiner does not accept the changes, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.
3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the voltage source inserted between the photoelectric conversion device and the cutoff device as stated in claims 22 & 30 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the examiner does not accept the changes, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

4. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.
5. The disclosure is objected to because of the following informalities:

On lines 10-11 of page 18 of the specification, the following phrase is awkwardly worded "The semiconductor photovoltaic device or a semiconductor photovoltaic device 65".

On lines 11-12 of page 25 of the specification, "outgoimg" should read "outgoing."

Appropriate correction is required.

Claim Objections

6. Claim 23 recites the limitation "two of said splitting device" in claim 17. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 17, 20, 24-25, 28, 32, & 34 are rejected under 35 U.S.C. 102(e) as being anticipated by US 7,049,574 B1 to Takeuchi ("Takeuchi").

With respect to claim 17, Takeuchi discloses a light control device comprising: nonlinear optical medium (9) as a splitting device for splitting an input signal light (8) to obtain idler photon (5) as a monitor light which is part of pumping light (8) as the input light; photon number detector (2) as a photoelectric conversion device for converting the obtained monitor light (5) into an electric signal; and gate device (4) as a cutoff device for cutting off the optical transmission path for transmitting the input signal light by receiving the electric signal from photon number detector (2) via the controller (3).

With respect to claim 20, Takeuchi discloses gate device (4) as a micromachine.

With respect to claim 24, Takeuchi discloses the cutoff device in the form of gate device (4) that holds an opened and closed state based on the electrical signal and controller (3) as a device for indicating the held open and closed state.

With respect to claim 25, Takeuchi discloses a light control device comprising: nonlinear optical medium (9) as a splitting device for splitting an input signal light (8) to obtain idler photon (5) as a monitor light which is part of pumping light (8) as the input light; laser (7) as a transmission device for transmitting an input signal light (8); photon number detector (2) as a photoelectric conversion device for converting the obtained monitor light (5) as part of the input signal light into an electric signal; and gate device (4) as an opening and closing degree control device for cutting off the optical transmission path for transmitting the input signal light by receiving the electric signal from photon number detector (2) via the controller (3).

With respect to claim 28, Takeuchi discloses gate device (4) as a micromachine.

With respect to claim 32, Takeuchi discloses the cutoff device in the form of gate device (4) that holds an opened and closed state based on the electrical signal and controller (3) as a device for indicating the held open and closed state.

With respect to claim 34, Takeuchi discloses a light control device comprising: nonlinear optical medium (9) as a splitting device for splitting an input signal light (8) to obtain idler photon (5) as a monitor light which is part of pumping light (8) as the input light; laser (7) as a transmission device for transmitting an input signal light (8); photon number detector (2) as a photoelectric conversion device for converting the obtained monitor light (5) as part of the input signal light into an electric signal; and gate device

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(4) as a cutoff device for cutting off the optical transmission path for transmitting the input signal light by receiving the electric signal from photon number detector (2) via the controller (3).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 18, 22-23, 26, 30-31, & 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 7,049,574 B1 to Takeuchi ("Takeuchi").

Takeuchi discloses the device as described in the discussion of claims 17, 20, 24-25, 28, 32, & 34.

With respect to claim 18, Takeuchi discloses the device as previously described, but does not explicitly disclose that photon number detector (2) as the photoelectric

conversion device is a semiconductor photovoltaic device. The use of semiconductor photovoltaic devices is known in the art and would have been obvious to one of ordinary skill in the art because semiconductor photovoltaic devices provide for adequate light sensing capabilities at a reasonable cost and relative ease of manufacture.

With respect to claim 22, the modified Takeuchi discloses the device as already discussed, but does not disclose the use of a voltage source. The use of a voltage source is known in the art and would have been obvious to one of ordinary skill in the art because the voltage source would allow for additional enhancement or control of the signal.

With respect to claim 23, the modified Takeuchi discloses the device as already discussed, but does not disclose second splitting device and disposition on a single planar optical circuit. The use of the additional splitting device would have been known in the art as an obvious duplication of parts and the single planar optical circuit is known in the art and obvious to one of ordinary skill in the art because this would reduce the size of the device.

With respect to claim 26, Takeuchi discloses the device as previously described, but does not explicitly disclose that photon number detector (2) as the photoelectric conversion device is a semiconductor photovoltaic device with a stack-type structure. The use of semiconductor photovoltaic devices is known in the art and would have been obvious to one of ordinary skill in the art because semiconductor photovoltaic devices provide for adequate light sensing capabilities at a reasonable cost and relative ease of manufacture.

With respect to claim 30, the modified Takeuchi discloses the device as already discussed, but does not disclose the use of a voltage source. The use of a voltage source is known in the art and would have been obvious to one of ordinary skill in the art because the voltage source would allow for additional enhancement or control of the signal.

With respect to claim 31, the modified Takeuchi discloses the device as already discussed, but does not disclose second splitting device and disposition on a single planar optical circuit. The use of the additional splitting device would have been known in the art as an obvious duplication of parts and the single planar optical circuit is known in the art and obvious to one of ordinary skill in the art because this would reduce the size of the device.

With respect to claim 33, Takeuchi discloses the device as previously described, but does not explicitly disclose that photon number detector (2) as the photoelectric conversion device is a semiconductor photovoltaic device with a waveguide structure. The use of semiconductor photovoltaic devices is known in the art and would have been obvious to one of ordinary skill in the art because semiconductor photovoltaic devices provide for adequate light sensing capabilities at a reasonable cost and relative ease of manufacture.

12. Claims 19 & 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 7,049,574 B1 to Takeuchi ("Takeuchi") in view of US 5,086,329 to Newman ("Newman").

With respect to claim 19, the modified Takeuchi discloses the device as previously described, but does not explicitly disclose the use of a semiconductor photovoltaic device having a nipi-type multijunction structure. However, the use of a nipi-type multijunction structure is known in the art because Newman discloses that NIPI structures have been used in optical structures (see Newman column 1, lines 60-61). To modify the teachings of Takeuchi with those of Newman would have been obvious to one of ordinary skill in the art because the structure would allow for accurate detection with a relative ease of manufacture.

With respect to claim 27, the modified Takeuchi discloses the device as previously described, but does not explicitly disclose the use of a semiconductor photovoltaic device having a nipi-type multijunction structure. However, the use of a nipi-type multijunction structure is known in the art because Newman discloses that NIPI structures have been used in optical structures (see Newman column 1, lines 60-61). To modify the teachings of Takeuchi with those of Newman would have been obvious to one of ordinary skill in the art because the structure would allow for accurate detection with a relative ease of manufacture.

13. Claims 21 & 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 7,049,574 B1 to Takeuchi ("Takeuchi") in view of US 7,148,469 B2 to Pearson ("Pearson").

With respect to claim 21, the modified Takeuchi discloses the device as previously described, but does not explicitly disclose the use of an absorption-type modulator or a refractive index-type modulator. The use of these types of modulators is

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known in the art because Pearson discloses a device with optical shutter (28) and discloses that the shutter can be an acousto-optic modulator (AOM) (see Pearson column 7, lines 8-11). To modify the teachings of Takeuchi with those of Pearson would be obvious to one of ordinary skill in the art as a functional equivalent because the acousto-optic modulator would provide for effective light blocking with effective control.

With respect to claim 29, the modified Takeuchi discloses the device as previously described, but does not explicitly disclose the use of an absorption-type modulator or a refractive index-type modulator. The use of these types of modulators is known in the art because Pearson discloses a device with optical shutter (28) and discloses that the shutter can be an acousto-optic modulator (AOM) (see Pearson column 7, lines 8-11). To modify the teachings of Takeuchi with those of Pearson would be obvious to one of ordinary skill in the art as a functional equivalent because the acousto-optic modulator would provide for effective light blocking with effective control.

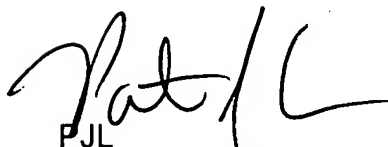
Conclusion

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick J. Lee whose telephone number is (571) 272-2440. The examiner can normally be reached on Monday through Friday, 8:00 am to 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on (571) 272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



PJL
October 9, 2007

Patrick J. Lee
Examiner
Art Unit 2878